new theory. Dr. F. E. Suess has expressed the opinion that these glassy fragments bear strong analogy to meteorites, and that they are in reality, like the latter, aerolites. In support of this view, in addition to other arguments, he lays special stress on the nature of the peculiar, though varying, surface sculpture of bouteillenstein, a sculpture not consistent with any theory of mechanical transport in water. Prof. Rzehak, however, has opposed this hypothesis of a cosmic origin, and brings forward arguments for its refutation. This author rather inclines towards the theory of an artificial origin; but Bareš, by experiments above referred to, applied a process of elimination to the various theories put forward for the terrestrial origin of the glass, and finally considered that of Dr. Suess to be most probably the correct one. A recent contribution to the literature of this subject is a short paper brought before the Böhmische Kaiser Franz-Josefs Akademie (Prague) by J. N. Woldrich last December. An abstract of this appears in the *Bulletin International* (dated 1898) issued by the Academy, and from the photographs illustrating that paper the accompanying figures have been selected for reproduction.

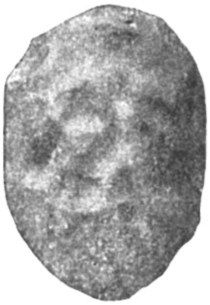

FIG. 4.

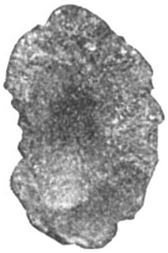

FIG. 8*a*.

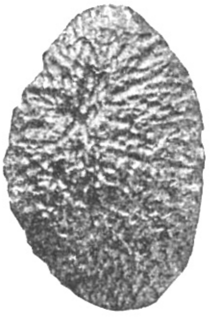

FIG. 6.

Herr Woldřich describes the surface markings of specimens in his own large collection, and points out the resemblance between certain of these Bohemian examples and the peculiar obsidian-bombs from Australia, described by Stelzner. Some of the Bohemian occurrences show, in fact, a hollow, bomb-like form. A fragment of such a specimen is represented in Fig. 8*a*. Figs. 4 and 6, photographed in natural size, show two characteristic types of sculpture, Fig. 4 exhibiting "finger impressions," and Fig. 6 a network of furrows, having in part a rough radial arrangement. The moldavite found both in northern and southern Bohemia occurs in sandy deposits which are regarded as belonging to either late Tertiary or early Diluvial time. Herr Woldřich considers that the known facts relating to moldavite and its distribution speak in favour of its extra-terrestrial origin, but that it is only known to occur in sandy deposits, whether in Europe or on other parts of the earth's surface, he regards as a striking circumstance.

NOTES.

AT a meeting of the Glasgow University Court held on the 13th inst., Principal Story presiding, a petition for leave to retire from the chair of Natural Philosophy was presented from Lord Kelvin. The Court granted the leave asked, and accepted Lord Kelvin's resignation with deep regret. A remit was made to the Principal to prepare a minute to be signed by all the members of the Court, expressing their sense of the great loss that the University is now to sustain. Lord Kelvin has occupied the chair for fifty-three years.

DR. P. F. RAYMOND, the successor of Prof. Charcot in the chair of Nervous Diseases at the Saltpêtrière, has been elected a member of the Paris Academy of Medicine.

PROF. KLEIN proposes to spend two or three weeks in this country, so that, after the work of the Catalogue Conference is finished, he can have an opportunity of discussing, with our mathematicians and physicists, the plan and scope of the second part of the *Encyklopädie der Mathematischen Wissenschaften*, which deals with Applied Mathematics. The season for his visit is in some respects unfortunate, as being a holiday time; on the other hand, there is the advantage that those who are to be found at home will have plenty of leisure to devote to the discussion of the details of this great work.

THE death is announced, at the age of eighty-seven years, of the Right Rev. Charles Graves, Lord Bishop of Limerick, who in 1843 was appointed Erasmus Smith professor of pure mathematics at Trinity College, Dublin. His published work appeared for the most part in *Crelle's Mathematical Journal*, and many of his theorems are to be found in text-books on geometry. In 1841 he edited a translation, with considerable additions, of Chasles' "Memoirs on Cones and Spherical Conics." He was elected President of the Royal Irish Academy in 1861, and a Fellow of the Royal Society in 1880.

THE death is announced in the *Athenaeum* of Dr. Eugen Ritter von Lommel, Rector of the University and a member of the Academy of Sciences of Munich. He was the author of several works, including "Das Wesen des Lichts," "Wind und Wetter," and "Lexikon der Physik und Meteorologie."

THE negotiations which for some time past have been carried on between the Royal Geographical Society and the University of Oxford with a view to the establishment at Oxford of a fully-equipped school or institute of geography, for the use, not only of Oxford graduates and undergraduates, but of others who desire to avail themselves of such an opportunity, have come to a satisfactory conclusion, and the school will begin operations in October next, under the direction of Mr. H. J. Mackinder. The Royal Geographical Society is to contribute 400*l*. annually for five years out of the 800*l*. required, and the school will be under the supervision of a joint committee of representatives of the Society and the University. At a recent meeting of the committee, the staff was appointed, Mr. Mackinder being the head of the school, and dealing specially with historical geography; Mr. A. J. Herbertson has been appointed assistant to the Reader, and will deal with physical geography, cartography, and surveying; Mr. H. N. Dickson has been appointed Lecturer on Physical Geography; and Mr. G. B. Grundy will in 1899–1900 lecture on ancient geography. The work of the school will include a course of systematic instruction primarily intended for graduates and other advanced students, with classes, demonstrations, and practical work in physical geography, cartography, and surveying. Courses of lectures will also be given with special reference to the historical and scientific teaching of the University The work will be carried on for five days each week during term. The lecture-room and laboratory will be in the Old Ashmolean

Museum, the upper floor of which is being fitted with the necessary appliances.

PARTICULARS have reached us of the autumn meeting of the Iron and Steel Institute, which, as has already been announced in NATURE, is to be held in Manchester from August 15 to 18 next. The following papers have been promised for reading:—On the constitution of steel, by Prof. E. D. Campbell; on diffusion in steel, by F. W. Harbord and Thomas Twynam; on the magnetic concentration of iron ore, by H. C McNeill; on India as a centre for steel manufacture, by Major R. H. Mahon, R.A.; on pig iron fractures and their value in foundry practice, by J. W. Miller; on practical microscopic analysis for use in the steel industries, by C. H. Ridsdale; on the relation between the structure of steel and its thermal and mechanical treatment, by Albert Sauveur; on the present position of the solution theory of carburised iron, by Dr. A. Stansfield; on the iron industry in the territory of his Highness the Nizam, by Shamsul Ulama Syed Ali Bilgrami; on a new casting machine for blast furnaces, by R. Hanbury Wainford; on the utilisation of powdered iron ore, by Prof. J. Wiborgh. In the outline programme, just issued, full particulars are given of a number of excursions for which arrangements have been made.

THE summer meeting of the Institution of Naval Architects, which is taking place this week at Newcastle-upon-Tyne, was opened on Tuesday, when papers were read by Sir Andrew Noble (on "The Rise and Progress of Rifled Naval Artillery"), Dr. F. Elgar (on "The Distribution of Pressure over the Bottom of a Ship in Dock, and over the Dock Blocks"), and Mr. Nelson Foley (on "A New System of Forced Draught").

A CONFERENCE was held at the Home Office on Tuesday with some of the principal pottery manufacturers, in reference to the report by Prof. T. E. Thorpe and Dr. T. Oliver on the employment of compounds of lead in the manufacture of pottery.

Science states that a laboratory for the physical analysis of soils has been established by the Maryland Geological Survey. A full outfit of apparatus has been installed, and work will be engaged in during the coming year upon the soils of Maryland, in conjunction with the geological surveying of the same area. The Survey has also recently had constructed an elaborate calorimeter for the determination of the calorific power of coal, preparatory to the investigations of the coal formations of Maryland, an exhaustive report on which is promised for an early date.

THE Magnetic Observatory at Vienna having had to be discontinued in consequence of the electric tramways and electric light wires, Prof. Pernter has submitted to the Austrian Government a plan for a new observatory to be situated at some distance from Vienna, and to be provided with instruments of the latest construction.

ACCORDING to the *Pharmaceutical Journal*, a committee has been formed in France to organise a public subscription in aid of scientific research, with a view to the discovery of new methods of treatment for infectious and contagious diseases. That the need is pressing will be seen when it is stated that France loses every year by these diseases two hundred and forty thousand victims, nearly double the number of lives lost in the Franco-Prussian war of 1870. Out of this total, tuberculosis is responsible for 100,000 deaths; typhoid fever and other contagious diseases, such as small-pox, measles, scarlatina, whooping-cough, diphtheria, and puerperal fever for 64,000, without speaking of the ravages caused at long intervals by cholera and plague.

THE committee appointed to inquire into the use of preservatives and colouring matters in food held their first meeting on Monday, when there were present Sir Herbert Maxwell, M.P (in the chair), Dr. Timbrell Bulstrode, Dr. Tunnicliffe, and Mr. C. J. Huddart (secretary). The terms of reference to the committee were under discussion, and certain preliminary matters were disposed of, a second meeting being fixed for early in August to complete arrangements for the carrying out during the hot weather of necessary experiments in relation to the use of preservatives and colouring matters in one and another class of food, and to settle the scope of the evidence to be taken when the committee reassemble in October next.

THE Liverpool expedition for the study of malaria in Sierra Leone, to which attention has already been called in these columns, will sail on July 29. In addition to Major Ross and Dr. Annett, each of the Liverpool School of Tropical Diseases, the expedition will include Mr. E. E. Austen, of the British Museum (Natural History), and Dr. S. Van Neck, official delegate of the Belgian Government. The School of Tropical Diseases has recently been in communication with the various Government departments concerned with regard to the forthcoming research. On July 1 the Colonial Office wrote that Mr. Chamberlain had learned with great satisfaction that the expedition of the Liverpool School was being sent, and that he appreciated the energy and public spirit shown by the Committee of the School in the matter. Mr. Chamberlain also stated that the local authorities at Sierra Leone will be instructed to give every facility to the work of the expedition.

THE Vienna correspondent of the *Times*, telegraphing to that paper on July 14, says the renewed experiments by Prof. Tuma and a number of officers of the Vienna garrison to test the possibility of wireless telegraphy between two balloons were attended with a certain degree of success. A balloon held captive at a height of 150 metres served in place of the mast used in the Marconi experiments, being connected with the despatching instruments on the ground by a copper wire. The second free balloon carried a receiving instrument and a wire which hung loose 20 metres below the car. In these conditions it was found possible to communicate with the three officers in the free balloon, who signalled with flags that they had received and understood the telegraphic messages. These signals were observed at an estimated height of 1600 metres and a distance of about 10 kilometres from the despatching station. Owing to the size and weight of the accumulators and the great danger of bringing them into close proximity to a large volume of explosive gas, it is thus far impossible to telegraph from a balloon to the ground or from one balloon to another. On the return of the officers to Vienna a comparison will be made between the detailed particulars noted by them and the report of the actual messages despatched.

THE Liverpool Section of the Society of Chemical Industry proposes, with the approval of the Council, to perpetuate the memory of the late Dr. Ferdinand Hurter, especially his great services to applied chemistry, by instituting a memorial lecture to be given every second year on some subject connected with applied chemistry. The lecturer will be chosen by the Liverpool Section of the Society, and it is proposed to collect a sum of 300*l.*, which it is supposed will be sufficient for the endowment.

ON the afternoon of Saturday, July 8, a marble bust of the late Prof. William Rutherford, F.R.S., was unveiled in the Physiology Class-room of the University of Edinburgh by Principal Sir William Muir, in the presence of, among others, Sir William Turner, Prof. T. R. Fraser, Prof. Crum Brown, Prof. Hunter Stewart, Dr. Clouston, and Dr. E. W. W. Carlier. The Lord Provost of Edinburgh and Prof. Schäfer sent apologies for absence. The bust, which is by Mr. John Hutchinson, was subscribed for by past and present members of the class of physiology. It bears the following inscription on the pedestal:—"In piam memoriam Gulielmi Rutherford, M.D., F.R.S., in Universitate Academica Edinburgensi, ab anno MDCCCLXXIV. ad annum MDCCCXCIX., Physiologiæ Professoris hanc effigiem posuerunt discipuli eius Universitatis huius cives. A.D. MDCCCXCIX."

SIR JOHN WOLFE BARRY, K.C.B., F.R.S., has been elected by the Council of the Society of Arts chairman for the ensuing year.

THE fourth International Congress of Psychology will be held in Paris from August 20–25, 1900. The organisation is left to the French members, and the following are the officers: President, Th. Ribot, professor of experimental and comparative psychology in the Collège de France; Vice-President, Charles Richet, professor of physiology in the Paris Faculty of Medicine; General Secretary, Pierre Janet, Director of the Laboratory of Psychology in the Collège de France. The seven Sections and the Presidents are as follows: (1) Psychology in its relations to physiology and anatomy, Prof. Matthias Duval; (2) Introspective psychology and its relations to philosophy, Prof. G. Séailles; (3) Experimental psychology and psycho-physics, M. A. Binet; (4) Pathological psychology and psychiatrie, Dr. Magnan; (5) Psychology of hypnotism and related questions, Dr. Bernheim; (6) Social and criminal psychology, M. Tarde; (7) Comparative psychology and anthropology, Prof. Yves Delage. Those wishing to attend the congress should apply to the Secretary, and those wishing to present papers should forward abstracts not later than January 1 next.

A COMBINED meeting of the German and Viennese Anthropological Societies is to be held at Lindau from September 4 to 7 of the present year.

AN expedition to determine the geological and mineralogical features of the almost unknown region lying between Buffalo Hump, in Idaho County, Idaho, and the Nez Perce Pass, in the Bitter Root range, has been organised and equipped by Colonel W. S. Brackett, of Peoria, Ill. The party numbers twelve men, all of whom are stated to be experienced mountaineers.

REPORTS from Vancouver, British Columbia, announce the ascent for the first time of Mount Morrison, the highest mountain in Formosa, by Stoepel, the explorer of the Pic of Orizaba n Mexico.

DR. D. J. LEECH, professor of materia medica and therapeutics at the Owens College, Manchester, will deliver the address inaugurating the winter session of the Pharmaceutical Society on October 2, and on the occasion the Society's Hanbury medal will be presented to Prof. Albert Ladenburg, of Breslau, for his researches into the chemistry of the atropine alkaloids.

THE "Board of Estimate and Appointment" for the City of New York has set aside 63,000 dollars for the zoological garden in Bronx Park. It is also proposed to raise the appropriation for the American Museum of Natural History from 90,000 to 130,000 dollars annually.

AN appeal has recently been made in the Manchester press, by the President and Secretary of the Manchester Literary and Philosophical Society, for help in restoring the tomb of Dalton the chemist. The appeal is made "to those residents of Manchester, chemists and others, who are interested in the work and fame of John Dalton." It appears that the funds of the Society cannot be used for the purpose, but the Council "have felt that the continued neglect of the resting-place of one of Manchester's greatest worthies would be a scandal and a discredit." The sum of 75*l.* in all is the amount endeavoured to be raised, it being thought that the interest on the sum remaining after the payment of present repairs has been made will suffice for keeping the tomb in repair.

MR. GRIESBACH states in the annual report of the Geological Department of India that last year a find of copper and gold was reported near the village of Rohera, a station on the Rajputana-Malwa Railway, in Sirohi territory. The place had evidently been worked for copper in ancient times, and to a considerable extent, as may be seen from the heaps of copper slag in the vicinity. The old mine had, however, not been sufficiently excavated at the time of the Director's visit to enable him to judge of the extent of the deposit.

A CONSIDERABLE amount of attention has, says the *Journal of the Society of Arts*, been given in France to what may be termed general agricultural education. Agricultural teaching, of a more or less rudimentary order, has been made obligatory at elementary schools, and a small garden for practical illustration has been attached to many of these institutions in rural districts, and the instruction thus given has, it is said, produced most beneficial results. The general instruction is given by departmental professors and special professors, whose duties may be divided into two distinct sections: (1) general instruction of adults—in the service of the Ministry of Agriculture; (2) teaching in the normal schools—in the service of the Ministry of Public Instruction. The tuition for adults takes the form of lectures, delivered in different parts of the department. The lectures are intended to enlighten landed proprietors, farmers, and others as to the best agricultural methods, the applications which can be made of scientific discoveries, &c.; in a word, to assist them in reaping the greatest possible profit from their land. The subjects treated naturally vary greatly according to the needs of the population of each department; the lectures, however, possess one characteristic in common, they are of an essentially "popular" type. The lecturer also, at the close of each lecture, places himself at the disposal of his audience, with the object of advising them individually regarding special questions, and of elucidating any points touched upon in his discourse which they may have failed to grasp. The most powerful aids to this class of teaching are found in the "experimental" and "demonstration" fields. Attention is also called to the agricultural stations and laboratories of the country, which, though not properly coming within the sphere of educational establishments, render considerable service to the agricultural population.

ACCORDING to the *National Geographic Magazine*, forecasts for forty-eight hours in advance, for all States east of the Rocky Mountains, were, for the first time in the history of the Weather Bureau, regularly issued from Washington each night during April of the present year.

ORDERS issued by the Government of India to civil surgeons with entomological proclivities require them "to make collections of mosquitoes and other flies that bite men or animals, in accordance with the instructions contained in Prof. Ray Lankester's pamphlet," with a view of determining the possible connection of malaria with mosquitoes. For the general detructions of mosquitoes several methods have, says the Indian correspondent of the *Lancet*, been tried. In many places the engineer has been successful by draining the marshy areas. In others the use of kerosene by throwing it into the water where it forms a film on the surface has prevented the developing larvæ from reaching the air, and has thus brought about their destruction. A more recent experiment has been the employment of permanganate of potash, which is said to kill the insect in all stages of its development. As this chemical has also been largely employed for purifying the water of doubtful wells, and especially with the view of protecting against the cholera bacillus, it would seem particularly applicable for use in India.

THE *Times* of Monday published a very interesting account of a visit paid by Dr. Karl Peters last April to some ruins near the river Muira, a southern tributary of the Zambesi, in Portuguese territory, nearly opposite Shupanga. The explorer made his journey in consequence of a passage in the *Atlas Historique*, which is to the effect that half a day's journey from the river Mansoro is the fort of Massapa, and near this is the great mountain of Fura, very rich in gold, in which are Cyclopean ruins. It was to find these ruins that Dr. Peters, accompanied by Mr. Leonard Puzey and Mr. Ernest Gramann, journeyed from the Zambesi. After recounting incidents of the journey, the writer says the decisive discovery for the exploration was made by Mr. Puzey on April 20. The ruins are situated on the hill which runs parallel to Mount Peters, and are about two miles distant from Inja-ka-Fura. Dr. Peters' description of his discovery is as follows: "We discovered . . . another ground-wall which had undoubtedly been a part of a building, maybe a temple, maybe a storehouse. This wall had been worked into the natural rock, which here forms a sort of flat floor. The stones of this ground-wall, samples of which I have sent to London, are heart-shaped, and are worked with a pick, so that the description in our old report saying the stones were not worked with a pick apparently only applies to the outer walls. Perhaps the author never took the trouble to visit one of the ruins. I laid bare a part of this ground-wall on the top, but gave up further digging because I was afraid that my clumsy workmen might do harm to the remains. They have, indeed, already destroyed part of the ground-wall. The stones of the wall are a pseudomorph sandstone, while the rock into which they are worked is quartzitic slate. The whole of the ruin is built after the general ancient Semitic pattern. The Cyclopean wall skirts the hill about halfway between the bottom and the top; on the top the buildings, the hoarding-place, and likely the temple were standing. The remains of a ground-wall along the edge of the top lead me to believe that a second wall formerly ran round the platform itself. To explore the ruin properly it will be necessary to send a scientific expedition with a proper outfit for such excavations. The débris have to be removed, and this I am sure will take a considerable time. Why the old conquerors chose this spot for their fort is easy to see. The Muira touches the bottom of the hill, so water was handy. A second river we have discovered at the back of the ruin. From the top they had an outlook over the wide plain before them, while they had the bulk of the Fura massive at their back. From their fort they commanded the plain as well as the mountain. I have called the hill on which the ruin stands after its discoverer 'Puzey Hill.' Mr. Puzey some days later found a second ruin west-north-west of the first on another head of the same ridge looking over the plain in the same direction. I am certain we shall find still more of these Cyclopean buildings when our time, which now is otherwise occupied, permits of a more extended exploration."

THE *British Central Africa Gazette* for May 24, which has just reached us, says "from time to time it has been rumoured that giraffes existed in British Central Africa, on the Loangwa River, but, although that river valley has been frequently visited during the last ten years by Europeans, no authentic information on the point has ever been obtained. Last month, however, a giraffe was shot on the east bank of the Loangwa in the Marimba district by a European prospector, and its skin (incomplete) sent in to Captain Chichester in Mpezeni's country. The hinder half of the skin is being sent to the British Museum, and it is hoped that a complete specimen may be now obtained. The existence of giraffe in Marimba is remarkable: the area in which they are found is extremely restricted, and their number appears to be very few. The one shot, however, was in a herd of about thirty-five. The nearest country north of Marimba in which giraffe are known to exist is north of Mareres, where the Elton-Cotterill Expedition met with them (many years ago). To the south, Matabeleland is the nearest giraffe country."

THE same number of the *Gazette* states that there seems to be no further decrease in the number of elephants still existing in the Protectorate; indeed, the natives round about Domwe have been complaining to the Acting Collector of the damage done in their food plantations by these animals.

IN the Johns Hopkins University *Circulars* for June 1899 a number of notes from the physical laboratory are published under the editorship of Prof. Joseph S. Ames. These comprise a short paper on the effect of temperature, pressure, and used solutions on the deposit of silver voltameters, by J. F. Merrill; notes on the energy-spectrum of a black body, and on the absorption of ice in the ultra-red, by F. A. Saunders; on the Zeeman effect, by H. M. Reese; on electric absorption in condensers, by L. M. Potts; on transference of heat in cooled metals, and on a method of measuring the frequency of alternating currents, by Carl Kinsley. A list of publications in the department of physics, by those who are now or who have been members of the University, is appended. This list, which represents roughly a year's work, occupies three columns, and includes over ninety works and papers by sixty authors. Similar notes and lists from the department of history and politics also appear in the same number, under the editorship of Prof. Herbert B. Adams.

THE *Berichte der Naturforschenden Gesellschaft* of Freiburg (Baden) contains several papers of interest to physicists. Kathode and Röntgen rays form the subject of a discourse by L. Zehnder, who deals somewhat fully with the theory of fluorescence; Prof. F. Himstedt describes apparatus for illustrating lecture experiments on Hertzian waves and on Marconi's telegraphy, and also writes on point-discharges in high-frequency currents. Of biological interest in the same number are Prof. G. Steinmann's notes on the formation of dark pigment in mollusca, and on *Boueïna*—a genus of fossil algæ, and August Grüber's note on green *Amoebae*.

A GOOD work is being done in Italy by the "Valle di Pompei," an institution in the province of Naples for rescuing and educating the children of prisoners and criminals. Apart from the philanthropic aspect of this undertaking, the *Report* contains statistics of interest to anthropologists, criminologists, and those who make a study of heredity. It would appear that under the salutary influence of their environment the children of the worst criminals often take a prominent place in the matter of good conduct and diligence.

THE U.S. Weather Bureau has issued a very useful pamphlet (*Bulletin* No. 26) entitled "Lightning and the electricity of the air," by A. G. McAdie and A. J. Henry. The work is divided into two parts: Part I deals with the electrification of the atmosphere and the best methods of protecting life and property from lightning, being to a large extent a revision of *Bulletin* No. 15—"Protection from lightning." Part 2 gives statistics of actual losses of life and property sustained in the United States during 1898. The principal facts of the paper are drawn from articles by the authors in various magazines, with the object of furnishing information of practical value generally, especially to those who may have occasion to seek protection from lightning. The work contains interesting particulars relating to the electrical potential of the upper air, as manifested by kite experiments and auroral displays.

THE Pilot Chart of the North Atlantic Ocean for July, issued by the Hydrographic Office of Washington, contains an article on tropical cyclonic storms or West India hurricanes which are prevalent at this season of the year. From a table showing the number of storms experienced between 1885 and 1898, it is seen that the greater number occur between August and October. The nature and mean path of the hurricanes are exhibited by a diagram. In its earlier stages, the centre of the path of the storm has a certain amount of westing, due to the general westward motion of the atmosphere in the low latitudes in which the storm originates, and the whirl is small, probably less than 100 miles in diameter, but its growth is rapid, so that in the middle and higher latitudes it may attain a diameter of 500 or even 1000 miles. The velocity of progression along the track of the disturbance reaches from twenty to thirty miles an hour in high latitudes, while the velocity of the whirl itself, in a direction against the hands of a watch, attains the force of a hurricane.

THE interesting and useful "Glossary of Popular Local and Old-fashioned Names of British Birds" contained in "A Dictionary of Bird Notes," by Mr. Charles Louis Hett, has been issued separately by Jackson, of Brigg.

THE additions to the Zoological Society's Gardens during the past week include a Bonnet Monkey (*Macacus sinicus*, ♂) from India, presented by Miss Nesta Bevan; a Black-faced Spider Monkey (*Ateles ater*) from Eastern Peru, presented by Mrs. K. E. Mackenzie; two Campbell's Monkeys (*Cercopithecus campbelli*, ♂ ♀) from West Africa, presented by Captain F. R. B. Parmeter; a Mozambique Monkey (*Cercopithecus pygerythrus*) from East Africa, an Arabian Gazelle (*Gazella arabica*) from Arabia, presented by Mr. B. T. Ffinch; two Common Foxes (*Canis vulpes*) from Russia, presented by Mr. A. H. Britten; an Arctic Fox (*Canis lagopus*) from Iceland, presented by Mr. M. Magnusson; five Common Hedgehogs (*Erinaceus europaeus*), European, presented by Mr. Geo. Long; three Chipping Squirrels (*Tamias striatus*) from North America, presented by the Rev. A. E. Tollemache; a Common Peafowl (*Pavo cristatus*, ♂) from India, presented by Miss A. S. Heldmann; two Climbing Anabas (*Anabas scandens*) from India, presented by Mr. P. Barford; two Rheas (*Rhea americana*, white var.) from Argentina, two Syrian Bulbuls (*Pycnonotus xanthopygos*) from Syria, an European Pond Tortoise (*Emys orbiculare*), European, deposited; two Rose-coloured Pastors (*Pastor roseus*), two Indian Mynahs (*Acridotheres ginginianus*) from India, two Bamboo Partridges (*Bambusicola thoracica*) from Northern China, two Lunulated Honey-eaters (*Melithreptes lunulatus*), two Pied Grallinas (*Grallina australis*), two Musky Lorikeets (*Glossopsittacus concinnus*) from Australia, purchased; a Japanese Deer (*Cervus sika*, ♀), born in the Gardens.

OUR ASTRONOMICAL COLUMN.

TEMPEL'S COMET 1899 *c* (1873 II.).

Ephemeris for 12h. Paris Mean Time.

1899.	R.A. h. m. s.	Decl. ° ′ ″	Br.
July 20	20 39 34·3	−18 4 26	3·570
21	40 46·1	18 37 9	
22	41 57·9	19 10 4	
23	43 9·5	19 43 9	3·662
24	44 21·1	20 16 22	
25	45 32·6	20 49 38	
26	46 44·0	21 22 55	
27	20 47 55·4	−21 56 9	3·698

HOLMES' COMET 1899 *d* (1892 III.).—Prof. C. D. Perrine gives full details of his rediscovery of the comet in *Astr. Journal*, No. 465. It was found with the 36-inch refractor, using a power of 270. It appeared as a round nebulous mass about 30″ in diameter, with only a slight brightening at the centre. The conditions were good, the sky being very clear and the star images steady. The object was very faint, not brighter than 16 mag., and very difficult to observe, so that the probable error of observation of its place was larger than usual.

DYNAMICAL THEORY OF NEBULÆ.—In No. 465 of the *Astronomical Journal*, Dr. E. J. Wilczynski gives an extended explanation of a dynamical theory of ring and spiral nebulæ which he first brought forward in 1896 (*Astro.-Phys. Journal*, vol. iv. p. 97, 1896). He starts with the assumption that the primordial nebula exists either as an assemblage of meteorites or as a gaseous mass obeying the laws of hydrodynamics. Then, in some unexplained way, each particle is to describe a circular orbit about the common centre of gravity, at which point there may or may not be a condensation. Such an arrangement is not necessarily stable, the limit depending on the relative ratios of the masses and distances of the individual particles, and the ratio of the mass of the central controlling body to its distance from the swarm. If these conditions allow stability the body may condense to a star, single or double. If the system be unstable, however, then on applying Kepler's third law to the revolving particles it is found that the inner members, owing to their greater angular velocity, constantly advance with respect to the outer ones, and after an interval the particles originally lying along a *radius* of the swarm will be drawn out into a spiral curve, as is actually the case in the bodies known as spiral nebulæ. According to this view, the *age* of a nebula would be to some extent indicated by the *number of its coils*, and the author gives an interesting suggestion that this might be investigated by a minute comparative examination of all photographs of spiral nebulæ of different dates. The paper concludes by indicating the possibility of determining the *law of rotation* of these bodies by a combination of spectroscopic and photometric observations.

THE NATAL OBSERVATORY.—The annual report of Mr. E. Nevil, Government Astronomer of the Natal Observatory at Durban, consists chiefly of the detailed meteorological observations made at the institution. The staff consists of the director, one senior astronomical assistant, one junior astronomical assistant, and one meteorological assistant. The astronomical equipment includes an 8-inch Grubb equatorial refractor, a 3-inch Troughton and Simms transit instrument, sidereal and mean time clocks, 3-inch portable equatorial refractor, and an automatic signal transmitter and recorder. Owing to a reduction in the vote to the observatory, much of the work has had to be put aside.

The system of time signals established over the Colony has been carried on without alteration, this being facilitated by the erection of new wires. Since the appointment of the astronomer in 1882 there has been no official residence, the computations, &c., having been mostly made in the open air.

This is at last to be remedied by the erection of a residence, all the fixtures, water supply, &c., however, being provided by the astronomer himself.

TEMPERATURE CHANGES IN YERKES OBJECT-GLASS.—Prof. Barnard has several times made series of measures with the large telescope to find if the changes produced in the instrument by variations in temperature were of sufficient amount to necessitate their consideration in delicate investigations. During the last year observations have been made of the focus at temperatures varying from −22° F. to +80° F., the range thus being 102° (*Astr. Journal*, No. 462). The means of the observations made on nineteen nights show a marked difference in the focus, and it was found that the object-glass shortened 0·26 inch more than the steel tube which carried it. Micrometric measures of the difference in declination between the stars *Atlas* and *Pleione* of the Pleiades showed a decrease of nearly 0″·2 (from 0″·676 during July–September to 0″·491 during January–February).

From the result of these experiments Prof. Barnard thinks that for exact work, such as parallax, with a large glass in a variable climate, these minute changes ought to be determined and taken into account.

In addition to these visual observations, careful determinations of the changes in the colour-curve during wide extremes of temperature are being carried on by Prof. Frost and Mr. Ellerman.